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REMARKS

The Examiner rejected Claims 2-11, 13-15, and 17-19 under 35 U.S.C. 103(a) as being unpatentable over Kielmeyer (US 5,583,468) in view of Gainey (US 6,313,519). Applicant traverses the rejection. Claims 5, 6, 10, 18 and 19 have been rewritten to correct minor typographical errors and to remedy some informalities of language that might otherwise provide grounds for rejection under 35 U.S.C. 112, second paragraph. These amendments do not add new matter or change the scope of the claims. Applicant will address these rejections starting from the independent Claim 5, as Claims 2-4 now depend from Claim 5.

With regard to Claim 5, the Examiner states that Kielmeyer discloses all the limitations of the Claim except for requiring that the first bond includes a ball bond and an intermediate bond, the intermediate bond being closer to the first edge than the ball bond. The Examiner looks to Gainey (Fig. 4) for the missing teachings. Gainey teaches (in column 2, lines 44-48) a scheme for shortening the free hanging length of a wire bond connecting two pads on separate structures by providing an intermediate support structure between the two structures and bonding the wire to that support so that the one long free hanging wire is replaced by two shorter free hanging wire segments. The Examiner maintains that it would have been obvious to use the teachings of Gainey to modify the invention of Kielmeyer in order "to increase the bond length while avoiding the problems associated with long bond wires (Gainey, col. 2, lines 40-55)."

Applicant disagrees with the Examiner's reading of Gainey as providing the missing teachings required to satisfy the limitations of Claim 5. Furthermore, Applicant submits that the motivation suggested by the Examiner for modifying the invention of Kielmeyer in view of the teachings of Gainey is flawed.

The Examiner refers to Figures 1-5 of Kielmeyer and identifies element 11 as the first planar transmission device with element 18 as the first conductive region and bond wire 38 as the bond wire of Claim 5. The Examiner also identifies element 56 as the second planar transmission device with element 44 as the second conductive region.

First, the Examiner has not pointed to any teaching in Kielmeyer that the first bond, i.e. the bond connecting wire 38 to region 47 in Figure 4, includes a ball bond. Furthermore, the Examiner has not pointed to any teaching in Gainey that any of the bonds taught therein are ball bonds. Hence, the combined teachings of the cited references do not teach all of the limitations of Claim 5.

Second, the combination of the teachings of Kielmeyer and Gainey would be a device with an intermediate structure between elements 11 and 56 shown in Figure 4. Wire 38 would be attached to this intermediate structure so as to divide the wire into two shorter free hanging segments. That would require a new structure within gap 55. However, Claim 5 requires that the ball bond and the intermediate bond that make up "the first bond" couple the bond wire to the first edge of the first conductive region of the first planar transmission device, not to another structure. Hence, the teachings of Gainey would need to be modified to provide the intermediate bond on element 11 between the ball bond and the first edge.

However, such a modification would not substantially alter the free hanging length of wire 38, since Kielmeyer states that the "connections of bond wires 38 and 39 to first and second edges 47 and 48 are to be made as closely as assembly techniques allow to the outside lengthwise edges of first substrate end 30 to minimize the reactance associated with the connection and minimize reflective loss" (Column 7, lines 56-60). Thus, the benefit of shortening the free hanging length of wire proposed by the Examiner as the motivation for altering the teachings of Kielmeyer is not available. Furthermore, there is no room for an intermediate bond between the bond shown in region 47 and the edge in the device taught by Kielmeyer. Hence, there is no reasonable expectation of success in making the modification suggested by the Examiner to the device of Kielmeyer.

Hence, Applicant submits that several limitations of Claim 5 are not taught by either Kielmeyer or Gainey, and there is no reasonable expectation of success in modifying the teachings of Gainey and applying the modified teachings to the device of Kielmeyer to shorten the free hanging length of wire 38. Accordingly, Applicant submits that the Examiner has not made a *prima facie* case for obviousness with respect to Claim 5 and the claims dependent therefrom.

With regard to Claim 6, which depends from Claim 5 and Claim 2, the Examiner states that Kielmeyer fails to disclose two of the limitations of Claim 6. First, Kielmeyer fails to disclose that the first bond includes a ball bond and an intermediate bond, the intermediate bond being closer to the first edge than the ball bond. Second, Keilmeyer fails to disclose a third bond comprising a second ball bond and a second intermediate bond, the first ball bond being closer to an end of the first center conductor than the second ball bond.

The Examiner looks to Gainey (Figure 4) for the missing teachings relating to the first bond. Gainey teaches (in column 2, lines 44-48) a scheme for shortening the free hanging length of a wire bond connecting two pads by providing an intermediate support structure between the pads and bonding the wire to that support so that the one long free hanging wire is replaced by two shorter free hanging wire segments. The Examiner maintains that it would have been obvious to use the teachings of Gainey to modify the invention of Kielmeyer in order "to increase the bond length while avoiding the problems associated with long bond wires (Gainey, col. 2, lines 40-55)." The Examiner does not provide any additional arguments regarding the additional teaching in the Claim relating to the third bond. Applicant assumes the Examiner intended to provide the same argument for the inclusion of the third bond as for the first bond, regarding increasing bond length while avoiding the problems associated with long bond wires.

First, as noted above with respect to Claim 5, Applicant submits that several limitations of Claim 5, from which Claim 6 depends, are not taught by either Kielmeyer or Gainey, and there is no reasonable expectation of success in modifying the teachings of Gainey and applying the modified teachings to the device of Kielmeyer to shorten the free hanging length of wire 38. This is true for each of the two bonds that Claim 6 requires.

Second, as noted above with respect to Claim 5, Kielmeyer teaches that bond wire connections should be made as close as possible to the outside edges of the substrate end to minimize reactance and reflective losses. Hence, Kielmeyer would teach that if two ball bonds were to be made, the two ball bonds should be equally close to the end of the first center conductor, not that one would be closer than the other.

Finally, the Examiner has not pointed to any suggestion in the art that it would be desirable to increase the length of the wirebond 38 taught in Kielmeyer or that the wire bond free hanging length is excessive. If anything, Kielmeyer teaches that the wire bond should be as short as possible to minimize reactance and reflective losses. Hence, the Examiner's grounds for combining the references are also flawed. Accordingly, Applicant submits that there are additional grounds for allowing Claim 6.

Claim 7 requires all the limitations of Claim 6 and additionally requires that the first center conductor has a width less than or equal to twice a bond target width. The Examiner states that Figure 1 of Kielmeyer teaches this limitation. Applicant submits that Figure 1 shows only that the width of the center conductor 30 is significantly larger than the width of the ends of the attached bond wires 38 and 39. Figure 1 does not show that the center conductor width is any smaller than the bond target width. Indeed, the Figure does not indicate how large the bond target width might be. The Examiner has not pointed to any disclosure on this subject in either Kielmeyer or Gainey.

Applicant directs the Examiner's attention to Figure 4 of Kielmeyer. This Figure shows the bond wires 38 and 39 bonded to regions 47 and 48. The Examiner maintains that these bonds each include a ball bond, and hence, are connected to a bond target. If this is the case, it is clear from Figure 4 that the width of center conductor 30 must be larger than two ball targets, since wires 38 and 39 are bonded to regions 47 and 48 as close to the end of conductor 30 as possible and a region remains between regions 47 and 48. Accordingly, if anything, Kielmeyer teaches away from this limitation. Hence, there are additional grounds for allowing Claim 7.

Claim 8 requires that the two planar transmission devices that are to be connected are microstrip transmission lines. The standard meaning of the term "microstrip transmission line" is implied, as the specification of the current invention does not offer an alternative definition, and Figure 2A cited by the relevant passage in the specification (paragraphs 29-33) is consistent with the standard meaning, which is a transmission line comprising a conductive strip on one face of a dielectric substrate and a patch much broader than the strip (a ground plane) covering all or at least a large portion of the opposite face of the substrate. See, for example, <http://www.polarinstruments.com/support/cits/AP122.html> for definitions and

illustrations of different types of microstrip transmission lines. The Examiner merely states that the twice modified invention of Kielmeyer satisfies this limitation; however, the Examiner has not pointed to any teaching in the cited prior art that specifies that both of the devices to be connected are microstrip transmission lines. Hence, Applicant submits that there are additional grounds for allowing Claim 8.

Claim 10 requires that both planar transmission devices are slot lines. The term "slot line" is defined in the specification of the current invention (paragraph 51 and Figure 7) as including two conductive planes separated by a dielectric region. The Examiner has not pointed to any teaching in Kielmeyer or Gainey that discloses that the two devices being connected are slot lines. Hence, Applicant submits that there are additional reasons for allowing Claim 10.

With reference to Claim 17, the Examiner states that Kielmeyer discloses, primarily in Figs. 4 & 5, all the limitations of Claim 17 except for requiring that the first bond includes a ball bond and an intermediate bond, the intermediate bond being closer to the first edge than the ball bond. The Examiner looks to Figure 4 of Gainey for the missing teachings. The Examiner maintains that it would have been obvious to use the teachings of Gainey to modify Kielmeyer in order "to increase the bond length while avoiding the problems associated with long bond wires (Gainey, col. 2, lines 40-55)". First, as noted above with respect to Claim 5, Applicant submits that the combination of Kielmeyer and Gainey does not teach that the first bond, i.e. the bond connecting wire 38 to region 47 in Figure 4, includes a ball bond. Second, again as noted with respect to Claim 5, there is no reasonable expectation of success in making the modification suggested by the Examiner to the device of Kielmeyer, as the free hanging length of wire would not be reduced, and there is no room to make the intermediate bond required by the Claim. Finally, as noted above, Kielmeyer teaches away from increasing the length of the wire bonds in question. Hence, Applicant submits that the Examiner has failed to make a *prima facie* case for obviousness with respect to Claim 17 and the Claims dependent therefrom.

Claim 18 requires the first ball bond to be closer to an end of the center conductor than the second ball bond. The Examiner admits that Kielmeyer does not teach this limitation. The Examiner looks to Gainey for the missing teachings. The Examiner maintains that it

would have been obvious to apply the teachings of Gainey to the system taught by Kielmeyer in order "to increase the bond length while avoiding the problems associated with long bond wires. (Gainey, col. 2, lines 40-55)." First, Applicant submits that the Examiner has not pointed to any teaching in Gainey regarding the first bond being closer to an end of a center conductor than the second bond. Second, as noted above with respect to Claim 5, the motivation of increasing bond length, suggested by the Examiner, is not an advantage for the device taught by Kielmeyer, and further, that Kielmeyer teaches away from lengthening the wire bonds. Hence, Applicant submits that there are additional grounds for allowing Claim 18.

Claim 19 requires that the component being connected to the first planar transmission device is a second planar transmission line with a second center conductor narrower than the center conductor of the first planar transmission line. The Examiner identifies element 44 as the second center conductor. Applicant submits that Figure 4 shows that the width of element 44 is significantly larger than the width of the center strip of the opposing transmission structure, i.e., element 30. As noted above with respect to Claim 7, Kielmeyer explicitly describes the features of Figure 4 as being shown "with an accurate relative scale" Hence, Applicant submits that there are additional grounds for allowing Claim 19.

The Examiner rejected Claim 20 under 35 U.S.C. 103(a) as being unpatentable over Kielmeyer in view of Gainey as applied to Claim 17 above and in further view of US 6,548,893 (Chen). Applicant traverses the rejection.

With respect to Claim 20, the Examiner states that Kielmeyer in view of Gainey discloses the claimed invention as described above except for the requirement that the first planar transmission device is a first coplanar strip line transmission structure having a first center conductor and a second center conductor and the component is a second coplanar strip line transmission structure having a third center conductor and fourth center conductor. The Examiner looks to Chen (col. 2, lines 25-45) for the missing teachings. The Examiner maintains that it would have been obvious to include a second conductor on the first device and a fourth conductor on the second device in the modified invention of Kielmeyer as is known in the art and evidenced by Chen in order "to allow for the simultaneous transmission of shielded signals. Moreover, it has been held that mere duplication of the essential working

parts of a device involves only routine skill in the art. *St. Regis Paper Co. v Bemis Co.*, 193 USPQ 8.”

First, as noted above with respect to Claim 17, from which Claim 20 depends, Applicant submits that the prior art combination of Kielmeyer and Gainey fails to teach all the limitations of that base Claim. Chen does not provide the missing teachings.

Second, again as noted above with respect to Claim 17, the motivation of combining Kielmeyer and Gainey to increase bond length, as suggested by the Examiner, is invalid for the device taught by Kielmeyer, and there would be no expectation of success in making that combination.

Third, Applicant disagrees with the Examiner's reading of Chen as providing the teachings specifying that both of the elements to be connected comprise coplanar strip line transmission structures. The passage to which the Examiner points (Column 2, lines 25-47) discusses buried strip lines 27 and microstrip segments 24 and 26 which loop over the main substrate plane 14. At most, Chen teaches multiple strip line transmission structures. Furthermore, these structures do not provide the EMI shielding that the Examiner recites as the motivation for combining the teachings of the references. Chen teaches the use of a metal lid over an integrated circuit to provide EMI shielding (Abstract). The plurality of microstrip lines 26 mentioned in the passage cited by the Examiner simply carry high speed signals between buried strip lines 27 and other signal sources or destinations such as integrated circuits. Neither the buried strip lines nor the microstrip bridges taught by Chen address the need for EMI shielding. Hence, the Examiner's motivation for combining the teachings of Chen with those of the other references is flawed, as the needed combination does not provide the benefit asserted by the Examiner. Accordingly, Applicant submits that the Examiner has failed to make a *prima facie* case for obviousness with respect to Claim 20.

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Respectfully Submitted,



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